

In a country like Israel, which is deeply committed to achievement of an expanded immunization program, the effort to reach this objective should be weighed within the national program aimed at elimination of the diseases controlled by mass immunization. Analysis of present achievements clearly shows that measles, together with poliomyelitis and rubella, deserves to be included among the first priorities of a program whose objective is elimination of clinical disease.

## Conclusions

A 17-year-old immunization program has created the basis for elimination of measles in Israel, provided that (a) the control policy is adapted to the seroepidemiology of the infection, and (b) a concentrated logistic effort is mounted in the period preceding the next expected epidemic. Under this effort:

- The nearly 90 percent vaccination coverage of each newborn cohort that has already been achieved should be maintained.
- A 97 percent immunization coverage should be aimed at for the target groups formed by preschool and elementary school children who missed the routine immunization at age 1 year.
- Similar coverage should be achieved by immunization of susceptible persons in selected groups of children, adolescents, and young adults at high risk.
- The immunization program should be complemented by disease surveillance aimed at early identification of

the main sources of infection, among them active foci still present in the neighboring territories.

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## Substance Abuse by Adolescents In Israel and France: A Cross-Cultural Perspective

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## Synopsis .....

Household surveys of urban youths 14–18 years of age were conducted in 1979 with 609 Israeli adolescents and

*in 1977 with 499 French adolescents. The overall order in the prevalence of use of legal and illegal drugs was identical in both countries. Cigarettes and alcohol were used by a larger proportion of young people than the illegal drugs; marijuana was used much more frequently than any other illicit drug. The same cumulative sequence of drug use appeared in the survey data for French and Israeli adolescents as in comparative data for adolescents in the United States—cigarette and alcohol use preceded the use of illicit drugs.*

*Striking cross-cultural differences appeared in the overall lifetime and current prevalences of use of all drugs, in the frequency of use, and in the age- and sex-specific rates for adolescents in Israel and in France. French youths uniformly reported greater lifetime and current use of all alcoholic beverages, cigarettes, and illegal drugs, more extensive involvement, and smaller sex differences than the Israeli youths.*

*Prevalence of the use of drugs in a culture appears to be associated with four social processes: higher number of times each drug has been used; greater persistence of involvement, as reflected by the proportions of current users among those who ever tried a particular drug; earlier age of first use; and a spread of the phenomenon throughout all groups in society that attenuates group differences in drug experiences. These cross-cultural re-*

*sults suggest a relatively conservative position with regard to accessibility and availability of substances: reducing availability may be one way to reduce individual consumption by impinging not on individual persons directly but on society.*

CROSS-CULTURAL EPIDEMIOLOGIC DATA permit insights into drug use behavior that cannot be gained with data for a single country. This is especially true when there are great contrasts in drug use in the cultures being compared. Data for a wide range of substances raise provocative questions with important policy implications:

- What is the relationship between the overall consumption levels and the patterns of use of a substance in a particular culture?
- What are the implications of the use of one substance for the use of other substances? How do stages of involvement affect use of other drugs?

Cross-cultural studies in Israel and France were conducted to test specific hypotheses derived from earlier work with American adolescents and to replicate in other societies the epidemiologic and psychosocial studies of adolescents in the United States. Earlier analyses in the United States indicated that the uses of legal and illegal drugs were closely interrelated and that illicit drug use was preceded by the use of legal drugs, with alcohol use a crucial step in this sequence (1,2a,3). An important issue, therefore, is whether wide differences in the use of alcoholic beverages between cultures affect the use of other drugs in those cultures.

France and Israel were selected for comparative analysis because of the striking differences in their patterns of alcohol consumption, as documented by indirect consumption indicators such as alcohol sales volume and alcohol-related disabilities. According to these indicators, Israel had one of the lowest rates of alcoholism and per capita consumption of alcohol and France had one of the highest rates in the world. On per capita consumption, France ranked 2nd out of 26 countries, Israel ranked 26th and last, and the United States ranked 16th (4).

In contrast to the United States, there were almost no epidemiologic data in Israel and France on drug use—whether tobacco, alcohol, or illicit drugs—by adolescents or adults (5–7).

## Methods

Two household surveys of urban youths 14–18 years old were conducted (a) in the spring of 1979, with 609 Israeli adolescents who resided in the four major urban centers in Israel—Jerusalem, Tel Aviv, Haifa, and Beersheba, and (b) in the spring of 1977, with 499 French youths in the Paris metropolitan area. All interviews were structured, and they were conducted in homes.

Because the Israeli sample included a lower proportion of 18-year-olds than the French sample (13 percent versus 26 percent), data were weighted to create a uniform distribution for each category in the age variable for each country.

I focused on three dimensions of drug use: lifetime prevalence—that is, the proportion who had ever used each drug; current use, defined as use in the 30 days before the interview; and lifetime frequency of use for each drug. With certain exceptions, the same questions were asked for all drugs in both surveys. Adjustments were made in the alcoholic beverages listed in the questions to reflect the range of beverages consumed in each country. In Israel, “white beer” was specified to avoid confusion with a nonalcoholic beverage known as “black beer.” I also distinguished ritualistic and nonritualistic uses of wine. My reporting will be confined to nonritualistic use. In France, questions were included about cider, and “apéritifs” and “digestifs” were specified among distilled spirits.

For comparative purposes, data will be drawn from the 1979 national survey of high school seniors from Monitoring the Future, an ongoing study conducted by the University of Michigan on an annual basis since 1975 (8–9). The sample of high school seniors included over 15,000 17- and 18-year-olds from 130 high schools in urban and nonurban areas. The questions in the American survey were phrased somewhat differently from those in the French and Israeli surveys.

“Drug” is used through this paper to mean tobacco, alcoholic beverages, and legal and illegal drugs. The term “legal drugs” indicates alcoholic beverages and

tobacco. Illegal drugs include marijuana and/or hashish, psychedelics, heroin, and use on one's own of psychotropic drugs that can be medically prescribed, such as amphetamines, barbiturates, and tranquilizers.

## Results

**Epidemiologic trends.** Striking cross-cultural differences for all drugs appeared in the proportions of those who had ever used them (lifetime prevalence), or were current users, in the frequency of use and in the age of onset of use.

*Lifetime and current use prevalences.* For all drugs surveyed, the rates of reported use in France exceeded those in Israel. With the exception of cigarettes, the higher the reported rate of use, the smaller the difference between the rates reported in each country (table 1).

The ranking in the proportions of young people having ever used the substances studied was similar in the two countries and resembled that reported in the United States (8). Beer and wine were reported to have been used by more young people in the three countries than distilled spirits, and the reported rate of use of all legal drugs exceeded that of all illegal drugs. Although more French adolescents had smoked than had drunk any alcoholic beverage except cider, in Israel more of those surveyed had drunk alcohol than had smoked cigarettes (table 1).

Among French adolescents, marijuana and/or hashish was used much more widely than any other illicit drug; marijuana and/or hashish was used almost four times as often as the next most popular illicit drug, replicating trends in the American survey (8). The lifetime prevalence of use of illegal drugs in Israeli adolescents was exceedingly small. No Israeli reported using drugs in three classes—psychedelics, amphetamines, and heroin. Only 3 percent of the Israeli adolescents reported in 1979

*France and Israel were selected because of the striking differences in their patterns of alcohol consumption—Israel had one of the lowest rates of alcoholism in the world and France had one of the highest.*

having used hashish or marijuana, a proportion similar to the 5 and 4 percent reported in 1971 and 1973 Israeli studies, respectively (10,11), and the 2 percent reported having ever "used drugs" in an Israeli study conducted in 1978–79 (12).

For all drugs, the proportion of youths who reported current use of the drug was much smaller than the proportion who had ever used it. The relative rankings for prevalence of current use were similar to the basic patterns observed for lifetime prevalence (table 1).

The cross-cultural differences observed between Israeli and French youths in the lifetime prevalence of all drugs surveyed persisted and were accentuated in the measures of current use. The reported rates of current use of alcoholic beverages and cigarettes were at least twice as high in the French sample as they were in the Israeli. Current use of illicit drugs in the two countries could not be compared because questions about use in the last 30 days were not asked in Israel. The trends are clearly shown by the ratios of "current" to "ever" users of each drug, which can be interpreted as measures of persistence in use. Not only were Israeli adolescents less likely than the French to begin to drink alcoholic beverages or smoke cigarettes, but they were also less likely to continue using them.

Table 1. Ever used and current use of various drugs by adolescents in France, Israel, and the United States (percentages)

Substance	France—1977			Israel—1979			United States—1979 <sup>1</sup>		
	Ever used (N≥474)	Last 30 days (N≥474)	Current to ever users (ratio)	Ever used (N≥525)	Last 30 days (N≥554)	Current to ever users (ratio)	Ever used (N≥15,500)	Last 30 days (N≥15,500)	Current to ever users (ratio)
Any alcoholic beverage . . .	. . .	. . .	. . .	. . .	. . .	. . .	93	72	.77
Cider . . . . .	84	35	.42	. . .	. . .	. . .	. . .	. . .	. . .
Beer . . . . .	80	54	.68	70	27	.39	. . .	. . .	. . .
Wine <sup>2</sup> . . . . .	79	54	.68	63	27	.43	. . .	. . .	. . .
Hard liquor . . . . .	75	48	.64	52	22	.42	. . .	. . .	. . .
Cigarettes . . . . .	82	64	.78	44	16	.36	71	34	.48
Any illicit drug . . . . .	26	15	.58	8	. . .	NA	65	53	.81
Hashish, marijuana . . . .	23	11	.48	3	. . .	NA	60	36	.60

<sup>1</sup> U.S. data derived from Johnston and coworkers (8).

<sup>2</sup> Includes only nonritualistic use.

NOTE: Leaders (. . .) indicate that the question was not asked. NA = Not applicable.

*Lifetime frequency of use.* The number of times French and Israeli youths used each drug surveyed is shown in table 2, with response distributions among the total samples in each country, as well as conditional distributions among those who had ever used each substance.

In France, between one-sixth and one-quarter of users of legal drugs had used the drug 60 or more times. These results stand in sharp contrast to those observed in the Israeli sample, which has a much lower percentage of heavy involvement in alcoholic beverages. Similar cross-cultural differences appeared for cigarette smoking: 62

percent of the adolescents who had ever smoked were no longer smoking in Israel as compared with 23 percent in France. Of current smokers, 7 percent of the Israeli adolescents surveyed versus 16 percent of the French were smoking a pack of cigarettes or more a day, 32 percent versus 46 percent were smoking less than a pack a day, and 61 percent versus 38 percent were smoking occasionally—less than once a day.

*Age of onset.* Differences between the two countries also appeared in the age when youths began to use

Table 2. Lifetime frequency of use of selected drugs in the total sample and among users in France, 1977, and Israel, 1979 (percentages)

Sample	Number	Never	1-2 times	3-9 times	10-39 times	40-59 times	60+ times
<i>Beer</i>							
France:							
In total sample . . . . .	482	19	17	21	16	8	19
Among users . . . . .	390	...	21	25	20	10	24
Israel:							
In total sample . . . . .	541	30	29	18	11	4	8
Among users . . . . .	379	...	41	26	16	6	11
<i>Wine<sup>1</sup></i>							
France:							
In total sample . . . . .	481	21	17	17	19	9	17
Among users . . . . .	381	...	22	22	24	11	22
Israel:							
In total sample . . . . .	571	44	31	14	7	2	4
Among users . . . . .	320	...	54	24	12	3	6
<i>Hard liquor</i>							
France:							
In total sample . . . . .	489	25	22	18	19	6	11
Among users . . . . .	366	...	29	24	25	8	15
Israel:							
In total sample . . . . .	566	51	30	12	4	1	2
Among users . . . . .	276	...	62	25	8	2	4
<i>Marijuana, hashish</i>							
France:							
In total sample . . . . .	495	78	9	5	4	0	4
Among users . . . . .	109	...	39	24	18	2	17
Israel:							
In total sample . . . . .	564	97	2	0	1	0	1
Among users . . . . .	18	...	50	11	17	0	22
<i>Barbiturates<sup>2</sup></i>							
France:							
In total sample . . . . .	474	94	4	1	1	...	...
Among users . . . . .	27	...	67	19	15	...	...
Israel:							
In total sample . . . . .	544	98	2	0	...	...	...
Among users . . . . .	11	...	82	18	...	...	...
<i>Tranquilizers<sup>2</sup></i>							
France:							
In total sample . . . . .	478	94	4	1	1	...	...
Among users . . . . .	30	...	70	17	13	...	...
Israel:							
In total sample . . . . .	542	96	3	1	0	...	...
Among users . . . . .	23	...	74	22	4	...	...

<sup>1</sup> Only nonritualistic use.

<sup>2</sup> Used 10 times or more was last category.

cigarettes and hard liquor. The age of onset was lower in France than in Israel. The median age of first experience among those who had ever consumed distilled spirits was 12.9 years in France and 14.3 years in Israel; for cigarettes the median ages were 13.3 and 14.0 years, respectively.

The inverse relationship between age of onset and overall prevalence levels of drug use is illustrated by U.S. data from the high school senior survey Monitoring the Future (9). Decreasing ages of onset accompanied rising overall prevalences of use, and rising ages of first use accompanied decreasing prevalences, as illustrated by the contrasts between marijuana and cigarette smoking (9). From 1979 to 1982, the proportion of seniors reporting any lifetime experimentation with marijuana increased from 47 percent to 59 percent. More than two and a half times as many users among high school seniors in 1982 as in 1975 (31 percent compared with 13 percent) reported their first experience with marijuana at the eighth grade or below. In that same period, by contrast, the use of daily cigarette smoking decreased from 27 percent to 21 percent. In contrast to a trend toward a lowering in the age of onset observed for marijuana, the ages of onset for cigarettes showed a trend toward higher ages of first use (9).

**Selected demographic characteristics.** For almost every drug surveyed, rates of use increased monotonically with age in both countries. The differences in rates of use of "any illicit drug" between Israel and French respondents also increased with age (table 3). Whereas in the younger cohort (the 14- and 15-year-olds), the reported rates of any lifetime use were about 2.4 times larger in France than in Israel, the rates were 4.0 times larger in the older cohorts of 18-year-olds.

Consistent sex differences existed in the use of all drugs (table 3). Except for barbiturates and tranquilizers, rates of lifetime experience with all drugs in both countries were higher for males than for females. In the French sample, 85 percent of the male adolescents surveyed had ever consumed beer, 79 percent had consumed

*'For all drugs surveyed, the rates of reported use in France exceeded those in Israel.'*

hard liquor, and 29 percent had used any illicit drug, compared with 77, 70, and 24 percent of the females, respectively. Differences between the sexes in Israel were much greater except for illicit drugs, which had minimal base levels of use.

Similar cross-cultural trends appeared for sex differences as for age differences. The sex differences were greater in Israel than in France and were inversely related to the overall prevalence of use of the various substances; that is, the higher the prevalence, the smaller the differences between the sexes (table 3). For example, the ratio of female to male users of marijuana and/or hashish was .69 in France as compared to .40 in Israel.

**Stages of drug involvement.** To determine to what extent developmental stages in drug use could be observed in France and in Israel, Guttman scalogram analyses were made in the absence of longitudinal data (13). Such analyses can uncover a cumulative ordering between events if one exists.

Although the coefficients of reproducibility for the French data are virtually identical to those reported for the American data, the coefficients of scalability, which take into account the departure of the observed scale from a theoretical random pattern, tend to be lower in the French sample. Nevertheless, all scale configurations that were acceptable in the American data (2b)—that is, having a coefficient of scalability of  $\geq .60$ —are acceptable in the French data. Data from this scaling analysis are not presented.

In both the American and the French samples, legal drugs were used first, followed by cannabis (marijuana

Table 3. Percentages of adolescents who had ever used various drugs by age and sex in France (1977) and Israel (1979)

Substances	France			Israel			France		Israel	
	14 years (N=83)	16 years (N=105)	18 years (N=122)	14 years (N=84)	16 years (N=140)	18 years (N=74)	Male (N=246)	Female (N=228)	Male (N=252)	Female (N=266)
Beer.....	70	85	83	64	73	73	85	77	79	62
Wine <sup>1</sup> .....	75	74	90	48	71	72	81	77	72	55
Hard liquor.....	58	76	91	38	55	64	79	70	61	44
Cigarettes.....	63	83	89	25	39	62	86	79	52	36
Hashish, marijuana.....	8	21	31	0	1	8	26	18	5	2
Any illicit drug.....	12	25	40	5	6	10	29	24	9	7

<sup>1</sup> Only nonritualistic use.

*'These epidemiologic findings have important policy implications. The data suggest that a systematic relationship exists between overall prevalence of drug use in a culture and certain aspects of drug behavior.'*

and/or hashish); pills (barbiturates, amphetamines, or tranquilizers); psychedelics, including lysergic acid diethylamide (LSD); and heroin, in that order. The sequence of use among the legal drugs in the surveys cannot be clearly established.

As noted earlier, Israeli youths reported much lower rates of use of any illicit drug than the American or French youths. To ascertain any pattern of use of illicit drugs in Israel, data on all use of illicit drugs must be collapsed into a single category. The resulting scale yields high degrees of reproducibility and scalability. Data on this scaling analysis are not presented (14).

The Guttman scale pattern, with its interpretation of a developmental sequence, gains strong confirmation in these observations on samples of French and Israeli adolescents, displaying virtually the same patterns of drug use that were found among American youths.

## Discussion and Conclusion

Despite cross-cultural differences in certain aspects of adolescent drug use, common features emerge from the foregoing analyses. A cumulative developmental sequence in adolescence was shown in France and Israel as well as in the United States—use of the legal drugs invariably preceded use of the illegal ones. In all three countries, the use of beer and wine preceded the use of distilled spirits. The order of smoking and of drinking distilled spirits cannot always be unambiguously determined, and the onset of smoking may occur at different points in the sequences of drug use in different countries.

It must be emphasized, however, that identification of a developmental sequence does not imply a causal ordering. Two or more events in a temporal sequence may be due to a complex set of conditions that precede both events. Furthermore, the identification of a developmental sequence does not establish that use of a particular drug invariably leads to a subsequent use of other drugs. Many youths stop at a particular stage of the sequence, and many regress to drugs used earlier. Use of a class of drug earlier in the sequence appears to be a necessary, although not sufficient, condition for progression to the class of drug in the next higher stage. The data establish,

however, that patterns of drug use in adolescence are likely to follow certain paths, and these paths are similar in Israel, France, and the United States.

In comparing cross-cultural rates of use of various drugs, two alternate consumption patterns could emerge. The high rate of use of one substance in a culture, especially alcohol, could indicate a general positive attitude about the taking of drugs that would be reflected in all aspects of drug use, and rates of use of all drugs would be uniformly high. Or, in a culture with a low rate of use of a particular substance, a compensatory process could be at work in which the low rate would be paralleled by a high rate of use of another substance. These are “additive” or “substitutive” effects, as suggested by Sulkenen in 1976 to interpret the uses of various alcoholic beverages in different societies (15).

France, Israel, and the United States represent three especially interesting cases for cross-cultural comparisons because those societies have very different levels of per capita alcohol consumption. French adolescents smoked cigarettes and drank alcoholic beverages at rates similar to those of the Americans, but had much lower rates of illicit drug use. The American adolescents had much higher rates of illicit drug use than adolescents in either of the other two countries (table 1). Thus, all cultures cannot be unambiguously ordered with respect to overall prevalence of drug use. Countries may be at various stages of evolution of specific drug use patterns.

These epidemiologic findings have important policy implications. The data suggest that a systematic relationship exists between overall prevalence of drug use in a culture and certain aspects of drug behavior. In particular, overall prevalence of the use of drugs in a culture appears to be associated with four social processes:

- greater involvement in drugs, as reflected in the frequency of lifetime use among users of each drug;
- greater persistence of drug use, as reflected in the proportion of adolescents who remain current users among those who had ever used a drug;
- earlier age of initiation to drugs that are used; and
- a spread of the phenomenon throughout all groups in society, so that group differences in drug experiences are attenuated, as shown by decreased sex and age differences in drug use patterns in adolescents in France as compared with Israel.

These cross-cultural results suggest a relatively conservative position on the accessibility and availability of drugs. Both for legal and illegal drugs, persistence and degree of involvement may be directly related to the overall prevalence of consumption levels in the society. Furthermore, in all three cultures, the use of illegal drugs is linked to the use of legal drugs. Much remains to be

learned about the factors, especially sociocultural factors, that may explain the broad societal differences in overall consumption patterns. Reducing availability may be one way to reduce individual consumption by impinging not directly on individual persons, but on society.

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## Abstract .....

### Automobile Injuries Related to Drug Abuse: an Introduction to Some of the Basic Considerations in Prevention and Research

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*Because of its 52-page length, the paper is given here in abstract. It is available from William Haddon, Jr., MD, Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037*

*Alcohol and other drugs are of importance in highway safety in several ways. These include affecting the frequency of crash occurrence, the accuracy of diagnosis and treatment, the use of seatbelts, and the scrutiny and handling of drivers and pedestrians by police and medical personnel. It is not logical, however, to assume that the damage to people and property produced by alcohol and other drugs can be only reduced by decreasing the amounts of their use. Other, but not mutually exclusive, options for reducing such injuries, such as providing vehicle occupants with far better "crashpackaging" can also be used.*

*The paper outlines a conceptual framework, a matrix, within which the various measures for reducing motor vehicle injuries and other damage can be identified. It notes the several ways in which alcohol and other drugs contribute to such injuries. It also points out that alcohol has been identified as an important cause of motor vehicle injuries in all countries in which it has been systematically sought, including in Scandinavia, Israel, the United States, and Australia.*

*It also considers a number of the approaches that may be used to provide quantitative evidence as to the extent to which alcohol and other drugs contribute to motor vehicle injuries. It also identifies a number of refinements in data collection which must be employed to avoid biasing of the data, and their dilution, with irrelevant information.*

*In addition, it provides examples of some of the approaches which have been used, with varying success, to lessen the motor vehicle crashes occurring as the result of alcohol abuse in connection with motor vehicles.*